

# Student Perceptions of Classroom Learning Environments: Development of the ClassMaps Survey

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*Abstract.* The purpose of this study was to describe the means, variability, internal consistency reliability, and structural validity evidence of the ClassMaps Survey, a measure of student perceptions of classroom learning environments. The ClassMaps Survey is a 55-item student rating scale of eight important classroom characteristics. The survey provides a brief, relevant, and conceptually simple appraisal of students' perceptions of the classroom conditions that contribute to academic engagement. Participants were 345 third-, fourth-, and fifth-grade students drawn from a public school in the Midwest and a second in the Northeast. Results demonstrated that 53 of the 55 survey items loaded onto their predicted subscale, subscale alphas were at or above .75, and the survey means were relatively consistent across grade and gender. Results suggest that the ClassMaps Survey is a promising measure that captures students' perspectives of classroom environments so they can be used to plan and implement classwide interventions.

In recent years, researchers and educational policy makers have worked to identify the social, psychological, and behavioral characteristics of classrooms that promote students' school success. Their interest has been prompted by evidence that students' active engagement in schooling can be attributed, in part, to characteristics of the educational context within which they are learning (National Research Council and the Institute of Medicine, 2004). Indeed, a careful analysis of school learning research conducted by Wang, Haertel, and Walberg (1990) showed that social and affective characteristics of classrooms rival traditional instructional and cognitive characteristics in their influence on learning. A likely mechanism is that these social and af-

fective characteristics promote students' active participation in learning (academic engagement), which, in turn, strengthens students' school achievement.

Research on students' academic engagement describes the classroom competencies, over and above cognitive-intellectual ability, that promote students' success in school. Students who are academically engaged demonstrate high levels of on-task behavior such as completing assignments, complying with teacher requests, working independently, seeking help when appropriate, volunteering to answer questions, and engaging in assigned tasks during instruction (Greenwood, 1991; Liaupsin, Umbreit, Ferro, Urso, & Upreti, 2006). High levels of on-task behavior are

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sometimes called *behavioral engagement*, a term that acknowledges that measures of on-task behavior do not necessarily differentiate between those students who are passively following classroom rules and those who are making committed efforts to learn (Fredricks, Blumenfeld, & Paris, 2004; Reschly & Christenson, 2006). Students who are not only diligent but also interested in their classroom work are cognitively engaged as well as behaviorally engaged. Students show even higher levels of school success if they are not only on task and interested, but also strive for knowledge, set personal goals for their learning, and regulate their effort so that they achieve these goals (Pintrich, 2003). In this instance, students can be identified as *autonomously engaged*. Other indices of academic engagement refer to when students are emotionally engrossed in learning (They're loving it!), are part of a strong social network within the school (They belong!), or when they move into leadership roles in their school that allow them to strengthen school-wide conditions for learning (They take charge!). Within this tiered model of academic engagement, students' participation in their education encompasses attitudinal and emotional aspects as well as behavioral elements.

There is strong consensus that students' academic engagement is a very important determinant of their school success (Fredricks et al., 2004; National Research Council and the Institute of Medicine, 2004; Reschly & Christenson, 2006). Students who are behaviorally and cognitively engaged have significantly higher grades, academic test scores, and performance on standards assessments. Early problems with engagement show long-lasting and detrimental effects on students' achievement, and students who are chronically disengaged are significantly more likely to drop out of school without graduating (Reschly & Christenson, 2006). Alternatively, students who are behaviorally, cognitively, and autonomously engaged are more likely to complete school and transition into successful and satisfying adult lives.

Researchers' attention has turned, recently, to identifying the malleable features of

classrooms that promote academic engagement in students: *classroom relatedness*, or the degree to which teachers and classmates foster a socially supportive community; *perceived competence* in the classroom, or the degree to which students expect to be successful in their learning; and *classroom supports for autonomy*, or the degree to which students' learning is self-directed (Furrer & Skinner, 2003; National Research Council and the Institute of Medicine, 2004). This evidence-based description of engaging classrooms is quite different from the construct of "classroom climate" that predominated in the 1950s and 1960s, which focused more narrowly on the social relationships that characterized a classroom. Unfortunately, there are too few technically sound and practical measures of the "engagingness" of classroom environments.

The purpose of this study was to examine the initial reliability and validity of a measure of student perceptions of classroom environments, the ClassMaps Survey (CMS). The survey operationalizes key features of engaging classrooms as identified in recent research. Classroom relatedness is measured by subscales that assess students' perceptions of teacher-student relationships, peer relationships, and home-school relationships. Perceived competence in the classroom is evaluated by a subscale assessing academic self-efficacy. Classroom autonomy is assessed by subscales that examine students' perceptions of their participation in classroom goal setting and decision making and behavioral self-control evidenced by all students in the classroom.

## **Classroom Relatedness**

### **Teacher-Student Relationships**

Teacher-student relationships encompass the caring, trust, respect, and fairness that exist between students and their teachers. Teacher-student relationships are similar to the attachment bonds between children and their parents in several respects (Kesner, 2000; Pianta, 1999). They are asymmetrical, with teachers holding more power and responsibility than students, but still dyadic, in that the

strength of the relationship is affected by both students and teachers (Greene, Abidin, & Kmetz, 1997). The adequacy of teacher–student relationships affect students’ behavioral outcomes (Hamre & Pianta, 2001; Pianta & Stuhlman, 2004), academic progress (Murray & Malmgren, 2005), and social success (Pianta & Stuhlman, 2004). In a practical sense, when students feel valued and respected by their teachers, they are more committed to learning and are able to cope better with adverse events in their lives. Both teachers and students can strengthen their relationship (Greenberg, Kusche, Cook, & Quamma, 1995; Pianta, 1999). Teachers can enhance the relationship by exhibiting warmth, caring, and helpfulness; modeling fair, even-tempered and responsible behavior; being truthful and open; using humor appropriately; and encouraging and empowering student independence and autonomy (Breckelmans, Wubbels, & Levy, 1993; Damon, 1992; Welker, 1977; Wentzel, 2002). Students can be taught strategies to develop and sustain supportive relationships with their teachers (Consortium on the School-based Promotion of Social Competence, 1994; Greenberg et al., 1995). The CMS assesses student perceptions of teacher–student relationships with the My Teacher subscale. (See Table 1 for a full list of CMS items.)

### Peer Relationships

Peer relationships include all of the relationships that students have with their classmates, including the positive and negative interactions that they have with their friends as well as acquaintances who are not close friends. Friends are identified whenever two students each prefer to spend time with the other; friendships provide students with companionship, assistance, comfort, and make school more fun (Johnson, Johnson, Buckman, & Richards, 1998). Students who have friends at school are more interested in academic activities and are more active participants in the classroom (Malecki & Elliott, 2002; Wentzel & Watkins, 2002). As such, peer relationships have been significantly correlated with academic achievement (Coie, Dodge, & Ku-

persmidt, 1990; Wentzel & Caldwell, 1997). The CMS’s My Classmates subscale assesses students’ beliefs that they have rewarding friendships at school.

Within peer relationships, it is not uncommon for students to experience normal peer conflict with their classmates and friends, such as teasing and arguments. One study found that a majority of students reported that they sometimes or always struggled with classmates teasing them (60%) or arguing with them (67%), although reported rates of physical aggression were much lower (Doll, 2006). Unresolved peer conflict can cause stress and lead to decreased student involvement in the classroom (Ladd, Birch, & Buhs, 1999). In addition, students who experience an inordinate amount of conflict with classmates are at risk for being disengaged from school, and eventually leaving school without graduating (Barclay, 1966; Kupersmidt, Coie, & Dodge, 1990). The Kids In This Class subscale of the CMS evaluates student perceptions of peer conflict within the classroom.

Unlike peer conflict, which frequently occurs between students and their friends, bullying often occurs between students and non-friends. Bullying is repeated peer aggression by more powerful students against younger or weaker students (Aluede, Adeleke, Omoike, & Afen-Akapida, 2008; Olweus, 1993). Between 10% and 20% of students encounter bullying regularly (Nansel, Overpeck, & Pilla, 2001). Academically, students who bully and those who are victims of bullying often perform poorly at school and victims often have higher rates of absenteeism and dropping out of school. In addition, both groups of students struggle with limited social skills and higher rates of depression and anxiety (Aluede et al., 2008; Paul & Cillessen, 2003). A useful index of peer bullying is the degree to which students worry about peers becoming aggressive towards them. On the I Worry That subscale of the CMS, students describe their worries about peer aggression.

Classroom practices can be established to encourage strong peer relationships and effectively address conflict and bullying. Activities that provide students with the opportunity

to work cooperatively and have fun together can be included in the classroom structure. Students can be taught how to identify appropriate resolutions for conflict and solve peer problems (Doll, LeClair, & Kurien, 2009). In addition, many schools are beginning to initiate antibullying programs and policies for which the efficacy is still being examined (Epselage & Swearer, 2003).

### **Home–School Relationships**

Home–school relationships incorporate all of the direct and indirect interactions that occur between students’ families and their school, including the face-to-face interactions between families and teachers as well as the intentional and unintentional communications that are sent between home and school. Multiple studies using diverse measures have demonstrated that frequent and effective interactions between families and schools are related to positive student outcomes. When parents are involved in their children’s schooling, students have higher rates of work completion (Epstein & Van Voorhis, 2001) and higher grades and test scores (Fan, 2001; Hill et al., 2004). In addition, students with involved parents have better attendance, have fewer suspensions, and are more likely to complete school (Anguiano, 2004; Epstein & Sheldon, 2002; Fan, 2001; Hill et al., 2004). Schools can adopt specific practices to foster home–school relationships: implementing parent-centered practices that promote involvement, inviting parents to participate, and expecting parents to do so (Hoover-Dempsey & Sandler, 1997). The Talking With My Parents subscale from the CMS describes the home–school relationship from the students’ perspective.

### **Perceived Competence: Academic Self-Efficacy**

Students’ success in the classroom is strongly influenced by their self-efficacy beliefs, their confidence that they can do what it takes to succeed in school (Pajares & Schunk, 2001; Schunk & Pajares, 2005). The power of self-efficacy is from its self-fulfilling quality such that students who believe they can suc-

ceed behave in ways that promote their success, so that they are more likely to succeed, and consequently develop stronger efficacy (Bandura, 1997). School classrooms provide opportunities for students to develop self-efficacy when students receive regular and prompt feedback on the work that they do to complete required tasks (Pastorelli et al., 2001). Other classroom experiences that influence students’ self-efficacy are their personal experiences of success and failure, their vicarious experiences of their classmates’ successes and failures, and verbal persuasion and encouragement from their teachers and peers (Pajares, 1996). The Believing In Me subscale of the CMS measures students’ academic efficacy.

### **Classroom Supports for Autonomy**

#### **Self-Determination**

Self-determination describes students’ capacity to deliberately manage their own learning. Self-determined students set useful and ambitious goals for themselves, act consistently with these goals, and devote appropriate amounts of time and energy to reach the goals (Masten et al., 1999). They understand that they are responsible for their learning, take credit for their academic successes, and devise concrete and rational plans to address academic failures. They clearly value academic progress and are intrinsically motivated students (Assor, Kaplan, & Roth, 2002; Masten, 2001). Self-determination is higher in classrooms managed by specific and attainable mastery goals to become competent at a skill, rather than performance goals to outperform other students in the class (Pajares & Schunk, 2001; Turner et al., 2002). The CMS assesses students’ self-determination with the Taking Charge subscale.

#### **Behavioral Self-Control**

A second characteristic of classrooms related to students’ autonomy is behavioral self-control. Behavioral self-control describes students’ self-management of their day-to-day behaviors and the degree to which their class-

room behavior is appropriate, rule governed, and goal directed (Bandura, 1989; Bear, 2005). Factors affecting students' behavioral control include the behavioral choices that students make, the standards that they set for their behavior, and the degree to which they meet these standards. Substantial research has demonstrated that academic success and behavioral conduct are intertwined (Hawkins et al., 2003; Masten et al., 2005). For instance, out-of-control behavior contributes to academic underachievement (Lane, Pierson, & Givner, 2003) and appropriate self-control in classrooms predicts some of the variance in students' grades (McDermott, Mordell, & Stoltzfus, 2001). Behavioral self-control is also related to important relational characteristics of classrooms; students lacking in self-control often have weakened relationships with their teachers and peers (Lane et al., 2003). Behavioral self-control is modifiable, as evidenced by many prominent evidence-based interventions designed to improve students' compliance with classroom rules (Camp & Bash, 1981; Greenwood, Maheady, & Delquadri, 2002; McConaughy, Kay, & Fitzgerald, 1999; Mitchem, Young, West, & Benyo, 2001; Sugai, Horner, & Gresham, 2002). These management strategies differ in the degree to which they are adult imposed or student centered (Bear, 2005). Ultimately, strategies that are student centered are more likely to strengthen students' self-regulated discipline and control. Students' perceptions of classwide behavioral control is assessed on the Following Class Rules subscale of the CMS.

### Development of the CMS

Initial development of the CMS began with a comprehensive review of the research literature describing the six aforementioned classroom characteristics with strong relations to school success: teacher-student relationships, peer relationships, home-school relationships, academic self-efficacy, academic self-determination, and behavioral self-control. For each characteristic, between 6 and 8 items were drafted to represent important as-

pects that had been identified in prior research. This early 40-item version of the survey then was piloted with over 400 middle school students, and feedback from the students and teachers was used to refine the items' wording, format, and practical utility to teachers (Doll, Zucker, & Brehm, 1999). Results showed that the survey factored cleanly into the six predicted subscales, but the subscales' internal consistency was inadequate for the peer relationships subscale ( $\alpha = .56$ ).

Next, in consultation with several elementary school teachers, wording for the 40 items was simplified so that the survey would be easily understood by elementary students. A uniform 3-point Likert-type response format was adopted, requiring that students answer "Yes," "Sometimes," or "No" to each item. This 40-item version (CMS 2004) was administered to 1,615 students from 82 classrooms in rural and urban communities in the Midwest (Doll & Siemers, 2004; Doll, Song, & Siemers, 2003). Results again showed that CMS 2004 factored cleanly into the six predicted subscales, but the internal consistency of two subscales fell below .70 ( $\alpha$  for Believing In Me and Taking Charge = .64 and .55, respectively.)

Over the next 2 years, several modifications were made to strengthen the technical properties of the CMS. In the CMS 2005, items were rewritten to use a 4-point Likert-type scale: *Never*, *Sometimes*, *Often*, and *Almost Always*. This change was sufficient to raise the internal consistency reliability from an average of .66 to an average of .74 (Doll et al., 2006). As with the CMS 2004, the factor structure of the CMS 2005 fit an eight-factor solution in which all items loaded on their predicted subscale (Doll & Spies, 2007). The factor analysis satisfied two of the three indexes suggested by Hu and Bentler (1999). The observed root mean square error of approximation (Steiger & Lind, 1980) value of .05 met the suggested criterion of less than .06, and the observed standardized root mean square residual (Bentler, 1995) value of .05 was well under the suggested criterion of .08. The confirmatory factor index (Bentler, 1990)



value of .913 was slightly less than the proposed criterion of .95.

Next, four additional revisions were made to create the CMS 2007 survey. The peer relationships subscale, which had repeatedly factored into two parts, was split into two subscales: one representing peer friendships and a second representing peer conflict. To simplify the language and eliminate all double negatives from item wording, the peer conflict items were rewritten as negative items (e.g., “Kids in this class argue a lot with each other.”). A third peer relationships subscale was added at the request of a participating school, and described students’ worries about peer aggression. Finally, items from the academic self-efficacy subscale and the self-determination subscale were refined to more clearly represent findings from research describing these characteristics. Subsequently, a factor analysis of seven of the eight CMS 2007 subscales (absent the I Worry That subscale) using a sample of 1,056 science students (Grades 5–8) demonstrated that items factored cleanly into the seven predicted factors, with coefficient alphas ranging from .80 to .91 (Doll, Champion, & Kurien, 2008).

Preliminary evidence from intervention studies using a small-*N* design suggested that the CMS 2004 subscale scores were responsive to classroom interventions (Murphy, 2002; Nickolite & Doll, 2008). Additional validity evidence also was secured by comparing subscales of the CMS to conceptually related measures. Parallel scales of CMS 2004 and the Yale School Development Program School Climate Survey were found to be significantly correlated (range = .47–.80; Paul, 2005). In another study using the CMS 2005, and consistent with our predictions, the correlation between the Friendship Features Scale and the My Classmates subscale was significant and robust ( $r = .81$ ) whereas the correlation with the Kids In This Class subscale was not ( $r = .28$ ; Doll et al., 2006). A third study demonstrated significant correlations between all subscales of the CMS 2007 subscales and the degree to which middle school science students valued their science instruction (Doll et al., 2008). An additional study demonstrated

that the CMS 2007 can be used successfully with English language learner (ELL) students, and that differences may exist between ELL and non-ELL students’ perceptions of the classroom environment (LeClair, Doll, Osborn, & Jones, 2009). Although these studies have provided preliminary evidence of the validity and reliability of the CMS, the aim of the current study was to conduct a more thorough examination of the technical properties of the CMS.

## Method

### Participants

The sample for this study included 345 students drawn from Grades 3–5 across two public schools: School 1 in a Midwestern plains state, and School 2 in a metropolitan East coast state. From School 1, 257 students participated including 84 third-graders (four classes), 92 fourth-graders (five classes), and 81 fifth-graders (five classes). Of these, 50% were male and 50% were female. Because the CMS was administered anonymously, student ethnicity was not linked to survey data. However, school enrollment data reported that 62% of School 1’s students were European American, 64% qualified for free or reduced-price lunch, and 21% were ELL students. Six of School 1’s teachers were male and eight were female; all were European American.

From School 2, 88 students participated, including 49 third-graders (three classes), 28 fourth-graders (two classes), and 11 fifth-graders (one class). Of these, 45% were male and 55% were female. This represents all third-graders who were present on the day of data collection, all fourth-graders who were present in two of the four fourth-grade classrooms, and the fifth-graders who were present in one of the four fifth-grade classrooms (representing 55% of the third-, fourth-, and fifth-grade classrooms in the school). School enrollment data indicated that 66% of School 2’s students were European American, 28% qualified for free or reduced-price lunch, and 4.6% were ELL students. Gender distribution was relatively consistent across schools and

grades, ranging from 41.1% to 54.5% male (45.5% to 58.6% female).

### Measure

The study described here used the CMS 2007, a 55-item survey describing students' perceptions of classroom conditions related to academic engagement. Each item describes a characteristic of the classroom or its students, and students respond using a 4-point Likert scale (*Never, Sometimes, Often, Almost Always*). Items describing positive attributes are coded with a value of 0 for *Never* and 3 for *Almost Always*, and negatively worded items are reverse coded so that higher scores always represent more positive judgments of the classroom. Items are organized into eight subscales (see Table 1). Five subscales describe relational aspects of the classroom, including teacher–student relationships (My Teacher, MT, 7 items), peer friendships (My Classmates, MC, 7 items), peer conflict (Kids in this Class, KITC, 5 items), worries about peer aggression (I Worry That, IWT, 8 items), and home–school relationships (Talking With My Parents, TWP, 7 items). Three of the subscales describe autonomy and perceived competence characteristics including academic self-efficacy (Believing in Me, BIM, 8 items), self-determination (Taking Charge, TC, 8 items), and behavioral self-control (Following Class Rules, FCR, 6 items). Ratings are averaged across all items in a subscale to represent a subscale score. In prior research, coefficient alphas for the CMS 2007 subscales ranged from .82 to .91 (Doll et al., 2008).

### Procedures

All study procedures were reviewed by the University of Nebraska Institutional Review Board. A description of the study was provided to all teachers in Grades 3–5. All eligible teachers in School 1 agreed to participate. In School 2, all third-grade teachers agreed to participate, but only 50% of the fourth- and 25% of the fifth-grade teachers agreed to take part in the study. Next, an Institutional Review Board approved notice of the study was mailed to parents of all students

of participating teachers, while copies of the CMS were made available in school offices for parents' inspection. No parents asked that their child be excluded from the study, but one student in School 2 was eliminated because of missing data. Two investigators administered the CMS anonymously to students in each participating classroom at a time identified by the classroom teacher; one investigator read the survey aloud from the front of the class while the second investigator circulated around the room to ensure that students were following along and to answer student questions.

### Data Analyses

Data in this study were comprised of 59 variables for each of the 345 students, including a school identifier to separate the two participating schools, a classroom identifier, student grade, student gender, and a value (0–3) representing one of four possible responses for all 55 questions on the CMS. Analyses began with an examination of the latent structure of the CMS 2007 using exploratory factor-analytic techniques. Although examination of previous versions of the CMS had supported an eight-factor structure for the survey, there was only one prior factor-analytic study of the CMS 2007, and this had been conducted with older students. Revision of the survey and the addition of a broader age range of students prompted additional evaluation of the survey's factor structure using exploratory factor analysis. Results were examined to determine whether the factor structure that emerged from the data matched the structure expected theoretically, thus providing evidence for or against the theory (Hair, Anderson, Tatham, & Black, 1998). A visual scree test was used to determine the probable number of latent factors (Cattell, 1966). The scree test identifies plausible factor solutions through the visual examination of a plot of the eigenvalues versus the number of factors; the point at which the curve begins to straighten out is indicative of the maximum number of factors (Hair et al., 1998; Tabachnick & Fidell, 2001). Because of the likelihood of mod-

erate correlations between these identified factors, a Promax rotation was selected. The  $k$  value of 4 was used to minimize the potential for bias (Tataryn, Wood, & Gorsuch, 1999). Three criteria were used to determine factor adequacy for the CMS 2007: five or more pattern coefficients  $>.30$ , coefficient alpha levels of  $.75$ , and consistency with the theoretical framework of the instrument. Once subscales were verified, factorial analyses of variance were used to examine grade and gender effects, and identified effects were described by their statistical significance and effect size.

## Results

### Factor Analysis

Several statistical tests were used to evaluate the appropriateness of the CMS data for factor-analytic procedures. The correlation matrix produced by the Bartlett Test of Sphericity suggested that the pattern of correlations was not random ( $\chi^2 = 8016.52$ ,  $df = 1485$ ;  $p < .001$ ; Bartlett, 1954). The Kaiser-Meyer-Olkin statistic (.880) indicated that the basic requirements for factor analysis met accepted standards (Kline, 1994).

Based on the visual scree test, plausible factor solutions were found for both two and eight factors. The two-factor solution accounted for only 33% of the total variance and was most illustrative of the CMS's overall format of six positively phrased subscales and two negative (and subsequently reverse coded) subscales. The eight-factor solution was a much better match to the survey's theoretical framework and accounted for almost 58% of the total variance. Further, the minimum average partials criterion indicated that eight factors were more appropriate than two factors. Factor intercorrelations ranged from  $-0.124$  (between IWT and TC), comparing two conceptually dissimilar subscales, and  $0.485$  (between IWT and KITC), measuring conceptually similar characteristics of worries about aggression and aggressive aspects of classmates' behavior.

Table 1 shows results of the eight-factor solution including factor pattern coefficients. Minor inconsistencies were noted with the predicted subscale assignment of four CMS items. Nine items loaded on the BIM subscale, which had an internal consistency of  $.82$  and represented students' overall belief in their ability to overcome obstacles to their learning. Two of these were items that loaded more strongly on the BIM subscale than their designated subscale. One of the seven MT items statistically matched better with the BIM subscale. Deletion of this item would have provided only a negligible increase in the internal consistency of the MT subscale, so it was retained in the MT subscale for reasons of conceptual clarity.

There were considerable cross-loadings between the BIM and TC subscales, and three (of eight) items from the TC subscale matched the BIM scale somewhat better than the TC subscale. However, two of these three items also loaded almost as strongly on the TC factor. All three items were retained on the TC subscale with no real sacrifice to the overall internal consistency of the TC subscale. However, this score pattern suggests that students in the primary grades may have difficulty distinguishing between concepts of self-efficacy (BIM subscale) and self-determination (TC subscale). All other coefficient scores matched the five expected subscales (MC, FCR, TWP, IWT, and KITC). Table 2 shows that coefficient alpha levels for the eight CMS subscales were strong, ranging from  $.79$  to  $.92$ .

### Group Mean Comparison

Table 2 presents the results of factorial analysis of variance of the CMS subscale means. With the levels of significance set at  $.05$ , a complex pattern emerges within the different levels of both gender and grade. With one exception, these significant grade or gender differences also demonstrated rather small effect sizes. These results have been grouped according to the four different patterns observed.



**Table 1**  
**Factor Pattern Coefficients for the Eight-Factor Structure of the CMS**

Item	Factor Pattern Coefficients							
	I	II	III	IV	V	VI	VII	VIII
<b>Believing in Me</b>								
I can do my work correctly in this class.	<b>.640</b>	-.072	.098	-.090	-.069	.031	.115	-.025
I can do as well as most kids in this class.	<b>.734</b>	-.041	-.236	-.008	.147	-.025	-.004	-.047
I can help other kids understand the work in this class.	<b>.380</b>	-.004	.082	.165	.024	-.064	.036	-.088
I can be a very good student in this class.	<b>.607</b>	.096	.092	.047	-.157	.050	-.172	.119
I can do the hard work in this class.	<b>.617</b>	-.055	-.102	-.073	.181	-.083	.053	-.090
I can get good grades when I try hard in this class.	<b>.625</b>	.082	-.220	.014	.004	.044	.059	.004
I know that I will learn what is taught in this class.	<b>.366</b>	-.013	.200	.126	.077	.019	.084	-.045
I expect to do very well when I work hard in this class.	<b>.573</b>	.124	.030	-.025	-.151	-.016	-.117	.099
<b>My Teacher</b>								
My teacher listens carefully to me when I talk.	-.112	<b>.701</b>	.081	-.015	.038	-.015	.073	-.032
My teacher helps me when I need help.	.060	<b>.658</b>	-.132	.036	.081	.042	-.040	-.115
My teacher respects me.	.067	<b>.757</b>	-.075	.000	-.025	.048	-.026	-.084
My teacher likes having me in this class.	.081	<b>.681</b>	-.064	.089	-.127	.054	.023	.084
My teacher makes it fun to be in this class.	.086	<b>.472</b>	.286	-.224	.118	-.112	-.035	.049
My teacher thinks I do a good job in this class.	<b>.530</b>	.140	.134	.076	-.069	-.028	.010	.040
My teacher is fair to me.	-.021	<b>.559</b>	.161	.012	.092	-.059	.017	.041
<b>Taking Charge</b>								
I want to know more about the things we learn in this class.	.011	.067	<b>.426</b>	.034	.115	.038	-.082	-.049
In this class, I can guess what my grade will be when I turn in my work.	<b>.305</b>	-.013	.189	.030	.182	-.135	.081	-.172
I work as hard as I can in this class.	<b>.450</b>	.021	<b>.308</b>	-.044	-.069	-.032	-.029	.080
I find and fix my mistakes before turning in my work.	<b>.329</b>	-.113	<b>.450</b>	-.019	.101	.021	.019	-.196
I learn because I want to and not just because the teacher tells me to.	<b>.301</b>	.006	<b>.458</b>	-.014	.008	.108	-.049	.043
When the work is hard in this class, I keep trying until I figure it out.	<b>.490</b>	-.120	<b>.432</b>	-.060	-.101	.008	-.015	.124
I know the things I learn in this class will help me outside of school.	.148	.146	<b>.306</b>	.089	.073	.022	.082	-.144
I can tell when I make a mistake on my work in this class.	.248	.020	<b>.350</b>	.010	.031	.031	.105	.003
<b>My Classmates</b>								
I have a lot of fun with my friends in this class.	-.159	.082	.131	<b>.735</b>	-.054	-.037	.045	.002
My friends care about me a lot.	.092	.019	-.152	<b>.820</b>	.018	-.045	-.041	.059
I have friends to eat lunch with and play with at recess.	.043	.062	.009	<b>.611</b>	-.022	.005	.042	.026
I have friends that like me the way I am.	-.092	.100	.004	<b>.760</b>	-.026	-.014	.030	.017
My friends like me as much as they like other kids.	.070	-.076	-.047	<b>.739</b>	.064	-.018	.030	-.039
I have friends who will stick up for me if someone picks on me.	.045	-.160	.042	<b>.788</b>	-.002	.068	-.051	-.038

(Table 1 continues)

Table 1 Continued

Item	Factor Pattern Coefficients							
	I	II	III	IV	V	VI	VII	VIII
Following Class Rules								
Most kids work quietly and calmly in this class.	.048	.025	.025	.001	<b>.593</b>	.069	-.080	.083
Most kids in this class listen carefully when the teacher gives directions.	-.054	-.035	.002	-.038	<b>.807</b>	-.023	.072	-.056
Most kids follow the rules in this class.	.024	.034	-.026	.017	<b>.663</b>	.061	.007	.082
Most kids in this class pay attention when they are supposed to.	-.005	-.006	.096	.003	<b>.728</b>	-.053	-.028	.068
Most kids do their work when they are supposed to in this class.	-.040	.087	.042	-.069	<b>.533</b>	.029	-.079	.206
Most kids in this class behave well even when the teacher isn't watching.	-.015	.071	.137	.125	<b>.498</b>	.038	-.027	.016
Talking With My Parents								
My parents and I talk about my grades in this class.	.032	-.026	.084	.145	.006	<b>.584</b>	-.083	.087
My parents and I talk about what I am learning in this class.	.063	-.092	.163	.163	.084	<b>.467</b>	-.128	.087
My parents and I talk about my homework in this class.	.026	.004	-.109	-.087	.022	<b>.820</b>	.027	-.018
My parents help me with my homework when I need it.	.026	.034	-.045	.021	-.127	<b>.667</b>	.059	.055
My parents and I talk about ways that I can do well in school.	-.158	.036	.056	-.036	.081	<b>.758</b>	.073	-.114
My parents and I talk about good things I have done in this class.	.102	-.022	.004	-.077	.041	<b>.765</b>	.082	-.092
My parents and I talk about problems I have in this class.	-.120	.023	.110	-.019	-.003	<b>.618</b>	-.050	.012
I Worry That								
I worry that other kids will do mean things to me.	-.106	.047	.092	.129	-.023	-.028	<b>.803</b>	-.027
I worry that other kids will tell lies about me.	.036	.008	-.004	-.062	-.020	.019	<b>.802</b>	.074
I worry that other kids will hurt me on purpose.	.023	-.003	.085	-.064	-.091	-.008	<b>.837</b>	.076
I worry that other kids will say mean things about me.	.028	.055	-.064	.033	.070	.021	<b>.815</b>	-.058
I worry that other kids will leave me out on purpose.	.041	-.018	-.050	.002	.025	.005	<b>.787</b>	.000
I worry that other kids will try to make my friends stop liking me.	.022	-.054	.077	.070	-.036	-.071	<b>.729</b>	.041
I worry that other kids will make me do things I don't want to do.	-.005	-.027	-.109	-.040	.045	.087	<b>.765</b>	.024
I worry that other kids will take things away from me.	.024	.031	-.083	-.008	-.049	.038	<b>.708</b>	.102
Kids In This Class								
Kids in this class argue a lot with each other.	.000	-.078	-.061	.052	.114	-.082	.073	<b>.636</b>
Kids in this class pick on or make fun of each other.	.032	-.047	-.114	.048	.094	-.097	.031	<b>.807</b>
Kids in this class tease each other or call each other names.	-.006	-.021	.040	-.030	.014	.024	.043	<b>.803</b>
Kids in this class hit or push each other.	.020	-.030	-.026	-.011	.015	.053	.109	<b>.722</b>
Kids in this class say bad things about each other.	-.068	.057	.002	-.037	.027	.036	.064	<b>.773</b>

Note. CMS = ClassMaps Survey. Pattern coefficients greater than .30 are in bold type.

**Table 2**  
**Means and Standard Deviations by Gender and Grade for Each**  
**CMS Subscale**

Subscale	$\alpha$	Grade 3		Grade 4		Grade 5	
		Male Mean (SD)	Female Mean (SD)	Male Mean (SD)	Female Mean (SD)	Male Mean (SD)	Female Mean (SD)
BIM <sup>a</sup>	.816	2.07 (0.48)	2.27 (0.59)	2.25 (0.48)	2.30 (0.56)	2.10 (0.53)	2.49 (0.45)
MT <sup>b</sup>	.820	2.49 (0.46)	2.56 (0.54)	2.58 (0.42)	2.52 (0.59)	2.32 (0.61)	2.43 (0.51)
TC <sup>b</sup>	.786	2.12 (0.54)	2.18 (0.56)	2.19 (0.55)	2.15 (0.51)	1.91 (0.56)	2.05 (0.48)
MC	.869	2.20 (0.72)	2.37 (0.74)	2.25 (0.77)	2.23 (0.76)	2.20 (0.80)	2.45 (0.63)
FCR <sup>c</sup>	.844	1.87 (0.60)	1.93 (0.64)	2.23 (0.56)	1.85 (0.69)	1.75 (0.54)	1.63 (0.80)
TWP <sup>b</sup>	.863	1.83 (0.78)	1.94 (0.74)	2.17 (0.68)	2.06 (0.77)	1.78 (0.88)	1.95 (0.80)
IWT <sup>a,d</sup>	.928	2.10 (0.83)	1.86 (0.88)	2.20 (0.92)	2.01 (0.92)	2.36 (0.78)	2.27 (0.66)
KITC <sup>d</sup>	.874	2.22 (0.64)	2.05 (0.88)	2.33 (0.84)	2.14 (0.79)	2.20 (0.73)	2.08 (0.61)

Note. CMS = ClassMaps Survey.

<sup>a</sup>Significant gender effect at .05.

<sup>b</sup>Significant grade effect at .05.

<sup>c</sup>Significant interaction of gender and grade at .05.

<sup>d</sup>Items were reverse coded.

**Gender effects after accounting for grade.** For the BIM subscale, the pattern of scores were consistently higher for girls than for boys, with a significant main effect for gender:  $F(1,339) = 14.04$ ,  $p = .001$ , partial  $\eta^2 = .040$ . This medium effect size indicated that girls endorsed greater levels of confidence that they could be successful in the classroom than boys.

**Grade effects after accounting for gender.** Grade effects with small effect sizes were observed for the MT and TC subscales. On the MT subscale, students in Grades 3 and 4 described relationships with their teachers that were significantly stronger than those described by students in Grade 5, with a significant main effect for grade but with a small effect size:  $F(2,338) = 3.10$ ,  $p = .046$ , partial  $\eta^2 = .018$ .

On the TC subscale, students in Grades 3 and 4 reported more willingness to try hard and take responsibility for their learning than students in Grade 5; the main effect for grade was significant but with a small effect size:  $F(2,338) = 3.74$ ,  $p = .025$ , partial  $\eta^2 = .022$ .

On the TWP subscale, fourth-grade stu-

dents disclosed significantly higher levels of communication with their parents about their classroom performance than both their younger (third-grade) and older (fifth-grade) peers. A significant main effect for grade was noted, but again with a small effect size:  $F(2,338) = 3.74$ ,  $p = .025$ , partial  $\eta^2 = .022$ .

Although students in lower grades described more frequent worries on the IWT subscale, a significant difference was only observed when comparing the third-grade students to their fifth-grade peers, and the effect size was small. A significant main effect for grade was observed in the IWT subscale, with  $F(2,338) = 2.99$ ,  $p = .016$ , partial  $\eta^2 = .024$ .

**No grade or gender effects.** There were two subscales where no grade or gender effects were observed. On both the MC and the KITC subscales, there were no differences between either grade or gender reports.

**Gender by grade interaction.** With the subscale FCR, a grade by gender interaction was observed. Fourth-grade boys reported that their classmates engaged in appropriate behavior (listening, paying attention) more

frequently than reported by the fourth-grade girls, with a significant interaction between grade and gender of  $F(2,338) = 3.72, p = .025$ , partial  $\eta^2 = .022$ . Again, the effect size was small.

### Discussion

A primary purpose of the CMS is to describe student perceptions of classroom conditions that contribute to academic engagement. Results of this study provided additional evidence of the survey's technical adequacy. First, an exploratory factor analysis demonstrated that the CMS factored as predicted into eight subscales assessing distinct classroom characteristics and that 53 of the 55 CMS items loaded onto their predicted subscale and 51 loaded primarily onto their predicted subscale. This replicates prior factor-analytic studies of the CMS 2005 (Doll, Kurien et al., 2009) and the CMS 2007 (Doll et al., 2008) and suggests that the factor structure of the CMS is fairly robust and consistent with the survey's conceptual framework.

Further, estimates of the CMS subscales' internal consistency reliability were mostly in the middle .80 range, and none were below .78. This level of reliability allows sufficient flexibility to use any of the eight subscales independently. Similarly high internal consistency was evident in two other investigations of the CMS (Doll & Spies, 2007; Doll et al., 2008), and provides additional evidence of the survey's technical adequacy.

Although both grade and gender effects were noted in subscale means, these effect sizes were typically quite small and suggested minimal systematic differences by student grade or gender. The one exception was the gender effect that was observed on the BIM subscale of the CMS; elementary girls in this study consistently rated themselves higher on items describing academic efficacy when compared to elementary school boys. The finding is consistent with previous research suggesting that elementary-aged girls rate themselves higher than elementary-aged boys in expectations of academic success (Skaalvik, 1990).

Taken together with prior research on the reliability and validity of the CMS, these results suggest that the survey is a promising measure of student perceptions of the classroom learning environment. Still, the current study used a relatively small sample size, and the two participating schools were both from moderately sized urban areas. For these reasons, it will be important for researchers to replicate this study in other settings, such as rural or metropolitan regions, and with students of different backgrounds or grade levels. Additional research is needed to examine CMS's technical adequacy in a broader sample of schools from diverse regions of the country. Systematic efforts are also needed to verify that the survey's scores are able to detect a range of student perceptions, distinguishing among those from truly excellent classroom learning environments, those from more typical classroom contexts, and those from classrooms with striking needs for improvement. An intriguing question is the degree to which student perceptions of classroom conditions are consistent with or discrepant from perceptions of teachers or independent observers in those classrooms.

With more research support, the brevity of the survey's subscales and their ease of collection could make it a practical measure for conducting needs assessments of specific classroom supports for students' academic engagement. In particular, four features of the CMS require additional examination. First, more information is needed to describe the variance of the CMS within and across classrooms in diverse geographic regions. Second, evidence is needed to describe the reliability of aggregated CMS ratings (averaged across all students) as descriptions of classroom characteristics. Third, investigations are needed to describe the range of CMS ratings and their sensitivity to changes in classroom characteristics. Fourth, evidence is needed that describes the degree to which the CMS can capture key changes that occur as a result of classroom interventions. The possibility of using any single subscale without administering the entire 55-item survey would be particularly useful when examining the effect of an

intervention that focused specifically on one characteristic of the classroom learning environment, although such an approach would first require research to determine the validity and reliability of CMS subscales used in isolation.

The availability of a technically sound measure makes it possible to conduct subsequent research on variability in student perceptions of classrooms across grades, ethnicity, or gender. For example, the current study explored the effect of student gender on perceptions of the classroom environment; an important extension of this line of research would be to examine interactions of student gender with teacher gender in students' classroom perceptions. In these elementary grades, girls demonstrated higher academic efficacy than boys, but future research could examine the degree to which this gender comparison varies depending on the academic subject or whether the relative academic efficacy of boys and girls shifted once students moved into the middle school grades. Another of the study's findings indicate that the fourth-grade students perceived their teachers as particularly skilled in forming supportive and caring relationships with their students; future researchers could examine the characteristics that skilled cohorts of teachers possess in their interactions with students.

Additional CMS research is already ongoing to examine the survey's technical properties with middle school students and ELL students, its relation to teacher perceptions of classroom environments, and its utility for supporting organizational change across a school or school district.

## References

- Aluede, O., Adeleke, F., Omoike, D., & Afen-Akapida, J. (2008). A review of the extent, nature, characteristics and effects of bullying behaviour in schools. *Journal of Instructional Psychology*, 35, 151–158.
- Anguiano, R. P. V. (2004). Families and schools: The effect of parental involvement on high school completion. *Journal of Family Issues*, 25, 61–85.
- Assor, A., Kaplan, H., & Roth, G. (2002). Choice is good, but relevance is excellent: Autonomy-enhancing and suppressing teacher behaviours predicting students' engagement in schoolwork. *British Journal of Educational Psychology*, 72, 261–278.
- Bandura, A. (1989). Human agency in cognitive theory. *American Psychologist*, 44, 1175–1184.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.
- Barclay, J. R. (1966). Sociometric choices and teacher ratings as predictors of school dropouts. *Journal of School Psychology*, 4, 40–44.
- Bartlett, M. S. (1954). A further note on the multiplying factors for various  $X^2$  approximations in factor analysis. *Journal of the Royal Statistical Society*, 16, 296–298.
- Bear, G. (2005). *Developing self-discipline and preventing and correcting misbehavior*. Boston: Allyn & Bacon.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychology Bulletin*, 107, 238–246.
- Bentler, P. M. (1995). *EQS structural equations program manual*. Encino, CA: Multivariate Software.
- Breckelmans, M., Wubbels, T., & Levy, J. (1993). Student performance, attitudes, instructional strategies and teacher-communication style. In T. Wubbels & J. Levy (Eds.), *Do you know what you look like? Interpersonal relationships in education* (pp. 56–63). Washington, DC: The Falmer Press.
- Camp, B. W., & Bash, M. A. (1981). *Think Aloud: Increasing social and cognitive skills—A problem-solving program for children*. Champaign, IL: Research Press.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245–276.
- Coie, J. D., Dodge, K. A., & Kupersmidt, J. B. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 17–59). New York: Cambridge University Press.
- Consortium on the School-based Promotion of Social Competence. (1994). The school-based promotion of social competence: Theory, research, practice, and policy. In R. J. Haggerty, L. R. Sherrod, N. Garnezy, & M. Rutter (Eds.), *Stress, risk, and resilience in children and adolescents* (pp. 268–316). New York: Cambridge University Press.
- Damon, W. (1992). Teaching as a moral craft and developmental expedition. In F. K. Oser, A. Dick, & J. Patry (Eds.), *Effective and responsible teaching: The new synthesis* (pp. 139–153). San Francisco: Jossey-Bass.
- Doll, B. (2006, July). *Resilient classrooms: Places where all kids succeed*. An invited workshop at the 3rd Annual NASP Summer Conference: Critical Skills and Issues in School Psychology, Chicago, IL.
- Doll, B., Champion, A., & Kurien, S. (2008, February). *Social and psychological context for high quality classrooms*. A poster presented at the 2008 Annual Convention of the National Association of School Psychologists, New Orleans, LA.
- Doll, B., Kurien, S., LeClair, C., Spies, R., Champion, A., & Osborn, A. (2009). The ClassMaps Survey: A framework for promoting positive classroom environments. In R. Gilman, S. Huebner, & M. Furlong (Eds.), *Handbook of positive psychology in the schools* (pp. 213–227). New York: Routledge.
- Doll, B., LeClair, C., & Kurien, S. (2009). Effective classrooms: Classroom learning environments that foster school success. In T. Gutkin & C. Reynolds (Eds.), *The handbook of school psychology* (pp. 791–807). Hoboken, NJ: John Wiley & Sons.



- Doll, B., & Siemers, E. (2004, April). *Assessing instructional climates: The reliability and validity of Class-Maps*. A poster presented at the annual convention of the National Association of School Psychologists, Dallas, TX.
- Doll, B., Song, S., & Siemers, E. (2003). Classroom ecologies that support or discourage bullying. In D. Espelage & S. Swearer (Eds.), *A social-ecological perspective on bullying prevention and intervention in American schools* (pp. 161–184). Mahwah, NJ: Lawrence Erlbaum Associates.
- Doll, B., & Spies, R. A. (2007, March). *The CMS*. A paper presented at the Annual Convention of the National Association of School Psychologists, New York.
- Doll, B., Spies, R., Strasil, E., LeClair, C., Fleissner, S., & Kurien, S. (2006, March). *Successful student study: Precursors to academic, social and behavioral success*. Paper presented at the Annual Convention of the National Association of School Psychologists, Anaheim, CA.
- Doll, B., Zucker, S., & Brehm, K. (1999, April). *Reliability and validity of ClassMaps*. A poster presentation at the annual convention of the National Association of School Psychologists, Las Vegas, NV. (ERIC Document Reproduction Services No. ED 435 934)
- Epstein, J. L., & Sheldon, S. B. (2002). Present and accounted for: Improving student attendance through family and community involvement. *Journal of Educational Research*, 95, 308–318.
- Epstein, J. L., & Van Voorhis, F. L. (2001). More than minutes: Teachers' roles in designing homework. *Educational Psychologist*, 36, 181–193.
- Espelage, D. L., & Swearer, S. M. (2003). Research on school bullying and victimization: What have we learned and where do we go from here? *School Psychology Review*, 32, 365–383.
- Fan, X. (2001). Parental involvement and students' academic achievement: A growth modeling analysis. *Journal of Experimental Education*, 70, 27–61.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74, 59–109.
- Furrer, C., & Skinner, C. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology*, 95, 148–162.
- Greenberg, M. T., Kusche, C. A., Cook, E. T., & Quamma, J. P. (1995). Promoting emotional competence in school-aged children: The effects of the PATHS curriculum. *Development and Psychopathology*, 7, 117–136.
- Greene, R. W., Abidin, R. R., & Kmetz, C. (1997). The index of teaching stress: A measure of student-teacher compatibility. *Journal of School Psychology*, 35, 239–259.
- Greenwood, C. R. (1991). Longitudinal analysis of time, engagement and achievement in at-risk versus nonrisk students. *Exceptional Children*, 57, 521–535.
- Greenwood, C. R., Maheady, L., & Delquadri, J. C. (2002). Classwide peer tutoring programs. In M. R. Shinn, H. M. Walker, & G. Stoner (Eds.), *Interventions for academic and behavior problems II: Preventative and remedial approaches* (pp. 611–649). Bethesda, MD: National Association of School Psychologists.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.
- Hamre, B., & Pianta, R. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72, 625–638.
- Hawkins, J. D., Smith, B. H., Hill, K. G., Kosterman, R. F. C., Catalano, F. C., & Abbott, R. D. (2003). Understanding and preventing crime and violence: Findings from the Seattle Social Development Project. In T. P. Thornberry & M. D. Krohn (Eds.), *Taking stock of delinquency: An overview of findings from contemporary longitudinal studies* (pp. 255–312). New York: Kluwer Academic/Plenum Press.
- Hill, N. E., Castellino, D. R., Lansford, J. E., Nowlin, P., Dodge, K. A., Bates, J. E., & G. S. (2004). Parent academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development*, 75, 1491–1509.
- Hoover-Dempsey, K. V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research*, 67, 3–42.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Johnson, D. W., Johnson, R. T., Buckman, L. A., & Richards, P. S. (1998). The effect of prolonged implementation of cooperative learning on social support within the classroom. *The Journal of Psychology*, 119, 405–411.
- Kesner, J. E. (2000). Teacher characteristics and the quality of child-teacher relationships. *Journal of School Psychology*, 28, 133–149.
- Kline, P. (1994). *An easy guide to factor analysis*. New York: Routledge.
- Kupersmidt, J., Coie, J., & Dodge, K. (1990). The role of poor peer relationships in the development of disorder. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 274–308). New York: Cambridge University Press.
- Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development*, 70, 1373–1400.
- Lane, K., Pierson, M., & Givner, C. (2003). Teacher expectations of student behavior: Which skills do elementary and secondary teachers deem necessary for success in the classroom? *Education and Treatment of Children*, 26, 413–430.
- LeClair, C., Doll, B., Osborn, A., & Jones, K. (2009). English language learners' and non-English language learners' perceptions of the classroom environment. *Psychology in the Schools*, 46, 568–577.
- Liaupsin, C., Umbreit, J., Ferro, J., Urso, A., & Upreti, G. (2006). Improving academic engagement through systematic, function-based intervention. *Education & Treatment of Children*, 29, 573–591.
- Malecki, C. K., & Elliott, S. N. (2002). Children's social behaviors as predictors of academic achievement: a longitudinal analysis. *School Psychology Quarterly*, 17, 1–23.

- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56, 227–238.
- Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy, N., & Ramirez, M. (1999). Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology*, 11, 143–169.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradovic, J., Riley, J. R., et al. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, 41, 733–746.
- McConaughy, S., Kay, P., & Fitzgerald, M. (1999). The achieving, behaving, caring project for preventing ED: Two-year outcomes. *Journal of Emotional and Behavioral Disorders*, 7, 224–240.
- McDermott, P. A., Mordell, M., & Stoltzfus, J. (2001). The organization of student performance in American schools: Discipline, motivation, verbal learning, and nonverbal learning. *Journal of Educational Psychology*, 93, 65–76.
- Mitchem, K. J., Young, K. R., West, R. P., & Benyo, J. (2001). CWPASM: A Classwide Peer-Assisted Self-Management Program for general education classrooms. *Education and Treatment of Children*, 24, 111–141.
- Murphy, P. (2002). *The effect of classroom meetings on the reduction of recess problems: A single case design*. Unpublished doctoral dissertation, University of Denver, Denver, CO.
- Murray, C., & Malmgren, K. (2005). Implementing a teacher-student relationship program in a high-poverty urban school: Effects on social, emotional, and academic adjustment and lessons learned. *Journal of School Psychology*, 43, 137–152.
- Nansel, T. R., Overpeck, M., & Pilla, R. S. (2001). Bullying behaviors among US youth: Prevalence and association with psychosocial adjustment. *Journal of the American Medical Association*, 285, 2094–2100.
- National Research Council and the Institute of Medicine. (2004). *Engaging schools: Fostering high school students' motivation to learn*. Committee on Increasing High School Students' Engagement and Motivation to Learn; Board on Children, Youth, and Families; Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
- Nickolite, A., & Doll, B. (2008). Resilience applied in school: Strengthening classroom environments for learning. *Canadian Journal of School Psychology*, 23, 94–113.
- Olweus, D. (1993). Bully/victim problems among schoolchildren: Long-term consequences and an effective intervention program. In S. Hodgins (Ed.), *Mental disorder and crime* (pp. 317–349). Thousand Oaks, CA: Sage Publications.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, 66, 543–578.
- Pajares, F., & Schunk, D. H. (2001). Self-beliefs and school success: Self-efficacy, self-concept, and school achievement. In R. J. Riding & S. G. Rayner (Eds.), *Self-perception* (pp. 239–265). Westport, CT: Ablex Publishing.
- Pastorelli, C., Caprara, G. V., Barbaranelli, C., Rola, J., Rozsa, S., & Bandura, A. (2001). The structure of children's perceived self-efficacy: A cross-national study. *European Journal of Psychological Assessment*, 17, 87–97.
- Paul, J., & Cillessen, A. (2003). Dynamics of peer victimization in early adolescence: Results from a four-year longitudinal study. In M. J. Elias & J. E. Zins (Eds.), *Bullying, peer harassment, and victimization in the schools: The next generation of prevention* (pp. 25–43). New York: Haworth Press.
- Paul, K. (2005). *SchoolMaps: A reliability and validity study for a secondary education school climate instrument*. Unpublished doctoral dissertation, University of Nebraska Lincoln.
- Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington, DC: American Psychological Association.
- Pianta, R. C., & Stuhman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review*, 33, 444–458.
- Pintrich, P. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 95, 667–686.
- Reschly, A., & Christenson, S. (2006). Prediction of drop-out among students with mild disabilities: A case for the inclusion of student engagement variables. *Remedial and Special Education*, 27, 276–292.
- Schunk, D. H., & Pajares, F. (2005). Competence perceptions and academic functioning. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 85–104). New York: Guilford Publications.
- Skaalvik, E. (1990). Gender differences in general academic self-esteem and in success expectations on defined academic problems. *Journal of Educational Psychology*, 82, 593–598.
- Steiger, J. H., & Lind, J. C. (1980, May). *Statistically based tests for the number of common factors*. Paper presented at the annual meeting of the Psychometric Society, Iowa City, IA.
- Sugai, G., Horner, R. H., & Gresham, F. M. (2002). Behaviorally effective school environments. In M. R. Shinn, H. M. Walker, & G. Stoner (Eds.), *Interventions for academic and behavior problems II: Preventive and remedial approaches* (pp. 315–350). Bethesda, MD: National Association of School Psychologists.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Needham Heights, MA: Allyn & Bacon.
- Tataryn, D. J., Wood, J. M., & Gorsuch, R. L. (1999). Setting the value of *k* in promax: A Monte Carlo study. *Educational and Psychological Measurement*, 59, 384–391.
- Turner, J. C., Midgley, C., Meyer, D. K., Gheen, M., Anderman, E. M., Kang, Y., et al. (2002). The classroom environment and students' reports of avoidance strategies in mathematics: A multimethod study. *Journal of Educational Psychology*, 94, 88–106.
- Wang, M. C., Haertel, G. D., & Walberg, H. J. (1990). What influences learning? A content analysis of review literature. *Journal of Educational Research*, 84, 30–43.
- Welker, W. (1977). Humor in education: A foundation for wholesome living. *College Student Journal*, 11, 252–254.
- Wentzel, K. R. (2002). Are effective teachers like good parents? Teaching styles and student adjustment in early adolescence. *Child Development*, 73, 287–301.
- Wentzel, K. R., & Caldwell, K. (1997). Friendships, peer acceptance, and group membership: Relations to academic achievement in middle school. *Child Development*, 68, 1198–1209.

Wentzel, K. R., & Watkins, D. E. (2002). Peer relationships and collaborative learning as contexts for academic enablers. *School Psychology Review, 31*, 366–377.

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